



Northstar Polymers (Div. of Tandem Products, Inc.)  
3444 Dight Avenue South, Minneapolis, MN 55406 USA  
Tel: (612)721-2911, Email: info@northstarpolymers.com

Technical Data Sheet

## MPP-D80D

### Durometer 80D Room-Temperature-Curable System

MPP-D80D is one of our polyurethane casting systems designed to make smaller quantity of plastic-like parts for prototyping and in-house tooling. Both part-A and part-B components are liquid at room temperature; the relatively long pot-life of the system enables the user to process easily. The cured part has mechanical property that is rigid with some flexibility. The combination of the hardness and flexibility makes durable parts that are hard but resist breaking by flexing to absorb impact force.

MPP-D80D is not recommended for applications which may be used as load-bearing parts in an elevated temperature. The material softens as the temperature rises. Consider using epoxy or unsaturated polyester resin for load bearing application at an elevated temperature.

System Code:	MPP-D80D
Part-A:	MNA-014
Part-B:	PCC-014
Mixing Ratio:	1 : 1 by weight (100: 115 by volume)
Processing Temperature:	Ambient for materials and molds
Pot-life:	8 minutes*
Demolding Time:	15 – 20 minutes for 1/2" or thicker parts in plastic-mold 1-1/2 hours for ¼" thick parts in a cold resin-mold
Complete Cure:	Overnight at room temperature

Note: The combined liquid components thicken gradually. It increases chance of trapping bubbles and expands as the part heats up with exothermic heat. We recommend finish pouring as early as possible or before the material starts to become thick.

#### Typical Physical Properties:

Cured Hardness:	80 – 85 D Durometer
Tensile Strength:	5,500 psi
Elongation:	10%
Die-C Tear:	467 pli





Northstar Polymers (Div. of Tandem Products, Inc.)  
3444 Dight Avenue South, Minneapolis, MN 55406 USA  
Tel: (612)721-2911, Email: info@northstarpolymers.com

## Component Properties

### Part-A

Product Code: MNA-014  
General Name: Isocyanate (MDI) Prepolymer  
NCO%: 29.5%  
Equivalent Weight: 143  
Specific Gravity: 1.22  
Viscosity: 50 – 100 cps at 77 °F

### Part-B

Product Code: PCC-014  
General Name: Curative (Polyol Blend)  
Equivalent Weight: 145  
Specific Gravity: 1.06  
Viscosity: 400 – 460 cps at 72°F  
(Contains 34% by weight of renewable material (castor oil))

## Recommended Procedure for Casting Parts in a Mold

- Store the material at room temperature until the actual temperature of the components are within the range of 72 – 86 °F. In cold season, the material may arrive frozen. Please consult Northstar Polymers and/or refer to the document given for the specific thawing method for the material. The work place humidity is recommended to be less than 50%. Use of a dehumidifier is recommended if your work place humidity is above 50%.
- Wear rubber gloves, long sleeves, and protective eyeglasses to avoid skin/eye contact of the material. (Refer to the safety and handling column at the end of the document for the details.)
- Molds made of wood, plasters, or any porous materials need to be sealed with a sealer such as acrylic or shellac sealer. Apply mold release after the sealer is completely dried. Solid silicone or solvent based release agent is recommended. Do not use water base release agent. Non-porous molds such as metal, solid plastic, or other polymers do not need to be sealed, but still requires mold release.
- Part-B material (PCC-014) has constituents that separate into layers while stored. Re-blend part-B component before dispensing each time. Use a clean/dry spatula or a hand-held powered mixer at low speed to agitate. Try not to enclose air bubbles while agitating.
- Use a clean/dry mixing container such as a plastic pail, and pour the correct ratio of part-A and part-B, according the ratio information on this document, into the mixing container. Use a dry/clean stainless steel spatula or a hand-held powered mixer at a medium speed to agitate the part-A/B mixture for 1 to 2 minutes depending on the batch size. Mix vigorously and thoroughly without whipping or enclosing too much air. Scrape the side and bottom of the container with a spatula as you agitate to ensure the homogenous mix.
- Pour the blended material into the mold. For finer details, you may need to pour slowly to cover the surface with fine detailed pattern first, and then fill the rest. For undercuts, fill to just above the undercut and tilt the mold/frame to let the air escape from the undercut sections then fill the rest. Material increases its viscosity gradually. For better resolution and less air traps, finish pouring before the material gets thick.
- Let the material cure at room temperature until it is strong enough to demold or until the demolding time specified in this document. The mold material cures to complete cure in about 24 to 48 hours at room





Northstar Polymers (Div. of Tandem Products, Inc.)  
3444 Dight Avenue South, Minneapolis, MN 55406 USA  
Tel: (612)721-2911, Email: info@northstarpolymers.com

temperature. You may also post cure the material at 150 – 180 °F for 6 to 8 hours after demolding to finish off curing faster.

## Other Information

This urethane material softens with heat. If you expect some load bearing property from the cured parts made of this material, the part's performance must be tested at the entire range of expected operating temperature range. Addition of powder filler may alleviate the softening effect at a higher operation temperature range. Using epoxy or unsaturated polyester resin may be recommended for applications that require higher operation temperature stability.

The material tends to trap air bubbles enclosed from the process. Using a meter-mixing/dispensing machine is recommended avoid enclosing bubbles from mixing and casting. Porous mold/substrate surface can also cause excess bubbles. If you use silicone rubber mold, the liquid state of this resin system can trap air on surface. Using a pressure vessel, put the entire mold, and cure this material under high positive pressure can also alleviate the bubbles. Put the resin in mold in vacuum chamber to extract bubbles before the material starts to solidify can also work to reduce air trapping. The parts can also be made in an enclosed mold to restrict bubbles from expanding while curing.

Exposure to sunlight, high heat, acid, solvents, or other strong chemicals can damage your urethane part. Addition of antioxidant and UV package can alleviate the damage from sun light and moderate heat. This is an aromatic polyurethane system, which changes color with exposure to sun light. It will turn yellow color from the exposure to light. UV package can also slow the color change.

This material can be filled with powder material to achieve various properties for your intended application. Typical filler materials used with this polyurethane casting material include glass micro-sphere, lime stone powder, and wollastnite. Powder fillers carry air and moisture on its surface and addition of powder filler inevitably encloses bubbles in the material. While the filled urethane material is cured in a mold, it can bubble and expand its volume. If filler is used, a compression mold (closed mold) may need to be used to control the expansion of the material.

Use of heat to process reduces the viscosity of the component materials, which may be useful for casting filled material or to recreate a higher mold resolution. If it is beneficial, you may heat the material up to the range of 110 to 160 °F to process as long as you have enough pot life for your process. Heating of the component materials would reduce pot-life of the material.

## Handling Information for the Component Materials

### Storage:

Part-A: Part-A component (prepolymer) contains isocyanate component, which is very much sensitive to moisture. If it is left in air, part-A will react with atmospheric moisture and will be ruined. This reaction is non-reversible. Soon after opening a can and dispensing the content, nitrogen gas or negative-40-degree-due-point dry air needs to be injected to the can to blanket the material. Silica gel or calcium chloride desiccant filter should be installed to 55 gallon drum-vent for your drum feeding system. The storage temperature should be at a room temperature between 72 and 90 °F (22 - 38 °C).





Northstar Polymers (Div. of Tandem Products, Inc.)  
3444 Dight Avenue South, Minneapolis, MN 55406 USA  
Tel: (612)721-2911, Email: info@northstarpolymers.com

Lower temperature (Below 65 °F or 18 °C) can cause this part-A to freeze. During the cold seasons, this material may be exposed to a very low temperature while shipping. The state of frozen material can be either solid, waxy, gelled, or has very high viscosity with creamy dark yellow color. If freezing is suspected, you need to thaw the material before using. You can use drum heater, industrial oven, or lab oven to heat it to 150 - 160 °F (65 - 71 °C) or until it is thawed. Thawed material should look translucent dark amber color with smooth liquid consistency.

Part-B: When part-B is exposed to ambient air, it can absorb moisture. Moisture contaminated part-B material may become source of degradation or excessive bubbles in the product. Although this material is formulated with less moisture sensitive materials, it is best to avoid exposure of the material to moisture in the air. Purging the empty space in the container with nitrogen gas or negative-40-degree-due-point dry air is also recommended to prevent moisture contamination of part-B. However most of the cases, keeping in an airtight container will be sufficient. Store it in a dry indoor storage at a room temperature between 72 and 90 °F (22 - 38 °C).

(The moisture contamination of part-B material is reversible. By heating material to 160 - 180 °F (71 - 82 °C) and vacuuming it at about 29" Hg negative pressure for several hours will reduce the moisture level.)

#### Safety:

The component materials are industrial-grade chemicals. Please keep them in a secure place and prevent access from any unauthorized individuals. The personnel who handle these materials need to read the Material Safety Data Sheet (MSDS) for detail information on safety and handling of the material. The MSDS for each component is sent with the shipment of the material.

When using this material, be sure to operate in a wide-open area with good air movement, or in a well-ventilated area. Wear rubber gloves, long sleeves, and protective eyeglasses to prevent skin/eye contact of the material. When your operation involves heating or spraying of the material, we recommend, in addition to the above, installation of a proper ventilation system and/or using an appropriate quality of respirator to prevent inhalation of the fume.

Direct contact of polyurethane raw materials to skin/eye, as well as ingestion may lead to health problems. No eating or smoking should be permitted at the working area. The operator should wash hands well with soap and water after handling the materials and follow the other procedures of the Standard Industrial Hygiene Practices. Please refer to the MSDS for each component for the detailed health information.

For any questions, please contact Northstar Polymers.

Tel: 612-721-2911.  
Fax: 612-721-1009  
Web Site: <http://www.northstarpolymers.com>  
E-Mail: [info@northstarpolymers.com](mailto:info@northstarpolymers.com)

**Notice:** All of the statements, recommendations, suggestions, and data concerning the subject material are based on our laboratory results, and although we believe the same to be reliable, we expressly do not represent, warrant, or guarantee the accuracy, completeness, or reliability of same, or the material or the results to be obtained from the use thereof, neither do we warrant that any such use, either alone or in combination with other materials, shall be free of the rightful claim of any third party by way of INFRINGEMENT or the like, and NORTHSTAR POLYMERS DISCLAIMS ALL WARRANTIES, EXPRESS OR IMPLIED, OF MERCHANTABILITY and FITNESS FOR A PARTICULAR PURPOSE. 5/30/2019

<http://www.northstarpolymers.com>

